# U.S. Market Update for the Wind Energy Industry

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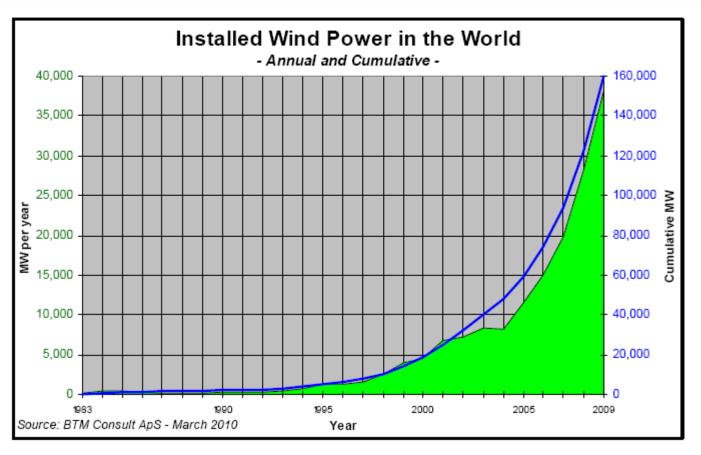
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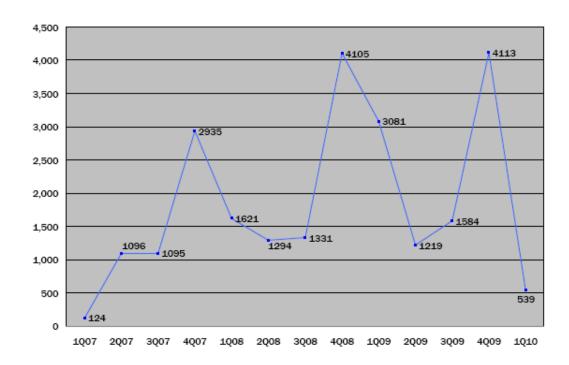






### Quarterly Installations Reflect Market Volatility

The cycle of wind capacity installations over the past few years, illustrated by the figure below, has created a poor environment for long-term investment decisions, particularly in wind manufacturing. Dozens of manufacturing companies have already made commitments to build and upgrade U.S. facilities, despite the market's booms and busts. These companies have created the foundation for renewing the American manufacturing sector and the U.S. could see explosive growth the instant there is a sign of market stability and U.S. commitment to long term policy.





### **Global Distribution of Wind Turbine Manufacturing**

C Region/country	Supply capacity in 2008	Share of global market in 2008	Number of wind turbine OEMs by Oct 2009
Europe	17,574	56.1%	28
Americas	5,479	17.5%	7
South & East Asia	7,458	23.8%	80
of which China	4,707	15.0%	(70)
India	2,752	8.8%	(10)
OECD-Pacific	815	2.6%	7
Total	31,326	100%	122

Sources: BTM Consult ApS internal files - Nov 2009

Comment: It shall be noticed that the Top-10 suppliers counted for 84 % of the total supply in 2008



### Installed capacity in 2008 and 2009 (Global)

10	Installed	Accu.	Installed	Accu.	% of installed
	MW	MW	MW	MW	MW
	2008	2008	2009	2009	2009
Total Americas	9,527	28,918	11,433	40,351	30.0%
Total Europe	9,179	65,971	10,738	76,553	28.2%
Total South & East Asia	8,201	22,174	14,991	37,147	39.3%
Total OECD-Pacific	1,056	4,272	622	4,890	1.6%
Total Africa	228	696	318	1,014	0.8%
Total other continents and areas:	0	127	1.7	129	0.0%
					_
Annual MW installed capacity	28,190		38,103		
Cumulative MW installed in the world		122,158		160,084	

Source: BTM Consult ApS - March 2010

### Wind Energy Policy

•	National Renewable Energy Standard	Status Never Passed
•	Production Tax Credit	Expires 2012
•	Investment Tax Credit	Expires 2016
•	1603 Grant in Lieu of Tax Credit	Expires 2010
•	Advanced Manufacturing Tax Credit	Capped at \$2.3 billion; 100% Allocated
•	Residential Tax Credit	Expires 2016

### Wind Energy Policy

- 1. Climate Change => "Climategate"
- 2. Reduce Dependence on Foreign Oil => \$150 p.b. vs. \$75 p.b.

3. Clean Jobs => 9.5 + Unemployment

U.S. Unemployment Report, March 2010

		Over the
	<u>Rate</u>	Year Loss
United States	9.7%	
Indiana	9.9%	38,700
Michigan	14.1%	96,500
Ohio	11.4%	147,000
Illinois	11.5%	148,500
Wisconsin	8.8%	74,800

Great Recession
Total U.S. Jobs Deficit
As of February, 2010

Total Jobs Lost: 8.4 million

Total New Job Demand: <u>2.7 million</u>

Total U.S. Jobs Deficit: 11.1 million

# Jobs! Jobs! Jobs! Production vs. Manufacturing Jobs

	Capital Invested	Jobs	
Benton County Wind Farms	>\$1 billion	<300	

Brevini Wind Delaware County <\$100 million >400

### Potential Wind Manufacturing Jobs at 10% RES

Type of Analysis	Assumes a 10% Renewable Generation Requirement and the Development of 50,000 MW of Wind Power in the United States to determine impact of Wind Turbine Component part and assembly manufacturing jobs.
Total Investment in Wind Turbine Component Parts and Assembly (based on \$1 billion per 1000 MW)	\$50,000,000,000 (AWEA)
Wind Manufacturing Jobs	
Rotor (28%)	42,000
Nacelle and Controls (21.7%)	32,550
Gearbox and Drive Train (17.3%)	25,950
Generator and Power Electronics (7.0%) Tower (26%)	10,500 39,900
Total (100%)	150,000 (AWEA)
Number of Wind Manufacturing Jobs to be located in the Midwest (ND, SD, NE, KS, MN, IA, MO, WI, IL, IN, MI and OH)	30,639 (AWEA)
Percentage of Wind Manufacturing Jobs to be located in the Midwest:	20.43%
Number of Wind Manufacturing Jobs to be located in Indiana	8,317 (AWEA)
Percentage of National Wind Manufacturing Jobs to be located in Indiana:	5.0545%
Percentage of Midwest Wind Manufacturing Jobs to be located in Indiana	27.145%
Percentage of National Population located in Indiana	2.098%

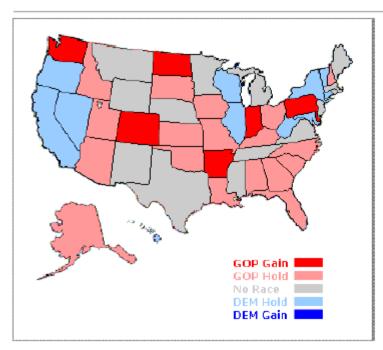
# The Battle For Capitol Hill – 2010 Senate

#### Projections for Thursday, July 22, 2010

Projected Seats: Democrats 50 Republicans 48 Independents 2

Current Seats: Democrats 57 Republicans 41 Independents 2

Projected Change: -7 +7 no change



#### Ratings Changes for Thu, July 22, 2010

### In Democrats' Favor

None

### In Republicans' Favor

None

<< Previous update

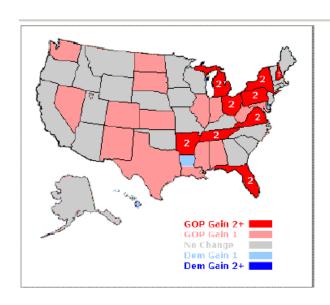
# The Battle For Capitol Hill – 2010 House

#### Projections for Thursday, July 22, 2010

Projected Seats: Democrats 226 Republicans 209

Current Seats: Democrats 256 Republicans 179

Projected Change: -30 +30



Ratings Changes for Thu, July 22, 2010

#### In Democrats' Favor

• Virginia CD-9: Weak DEM -> Mod DEM

#### In Republicans' Favor

• Virginia CD-5: Weak GOP -> Mod GOP

# U.S. Tea Party Movement – Cut Government Spending



### THURSDAY, APRIL 15<sup>TH</sup>, 2010 11:30 AM TO 1:00 PM

GENESEE CROSSROADS PARK (SAME AS LAST YEAR) ANDREWS & FRONT ST., ROCHESTER, NY 14614



#### Join us in Saying:

- **♀** STOP THE SPENDING
- WE'RE BEING TAXED ENOUGH ALREADY
- LESS GOVERNMENT= MORE FREEDOM!
- AND EDUCATE YOURSELF AT OUR INFO TABLES

New York Times/CBS News Poll (April 15, 2010):

- "Tea Party supporters are wealthier and more welleducated than the general public, and are no more or less afraid of falling into a lower socioeconomic class"
- 18% of Americans identified themselves as supporters of the Tea party movement.
- When asked "What should be the goal of the Tea Party Movement?:

% Selected	<u>Answer</u>
45%	Reduce Federal Government
6%	Cutting Budget
6%	Lowering Taxes
7%	Electing their own candidates
9%	Creating jobs
7%	Something else
18%	All of them
3%	No answer

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More Info: WeSurroundRochester.com

### Post Election "Lame Duck Session"?

- 2010 Congressional Election: November 2, 2010
- 2010 Congressional Session Ends: January 3, 2011
- 61 Days Post Election
- December 24, 2009 Christmas Eve U.S. House and Senate passed Health Care Legislation
- Spending Cuts and Tax Legislation requires "50 + 1" votes in the Senate and 216 votes in the House
- Policy Legislation (e.g. Comprehensive Energy & Climate Bill) requires 59 +
   1 votes in the Senate and 216 votes in the House

### 2010 Wind Energy Policy Objectives

<u>National Renewable Electricity Standard (RES)</u>. At least twenty-five percent (25%) of the nation's electricity to come from clean energy by 2025.

<u>Performance Based Section 1603 Production Grant Program</u>. A five (5) year \$25 billion Section 1603 Production Grant In Lieu of Tax Credits Program competitively allocated and awarded to those energy production developers that commit to achieve the greatest amount of capital investment and the highest number of retained and new jobs in the U.S.

<u>Performance Based Section 48C Manufacturing Grant Program</u>. A five (5) year \$25 billion Section 48C Grant In Lieu of Tax Credits Program competitively allocated and awarded to those clean energy products manufacturers that commit to make the greatest amount of capital investment and the highest number of retained and new jobs in the U.S.

<u>Clean Energy Manufacturing Revolving Loan Fund</u>. A \$30 billion revolving loan program to help small and med-sized manufacturers in the clean energy industry.

<u>Residential Renewable Energy Tax Credit</u>. A five (5) year thirty percent (30%) individual income tax credit (with no cap) for clean energy systems installation (new construction or replacement).

Jobs! Jobs! Jobs!

"Clean Energy Standard" = U.S. Manufacturing Jobs

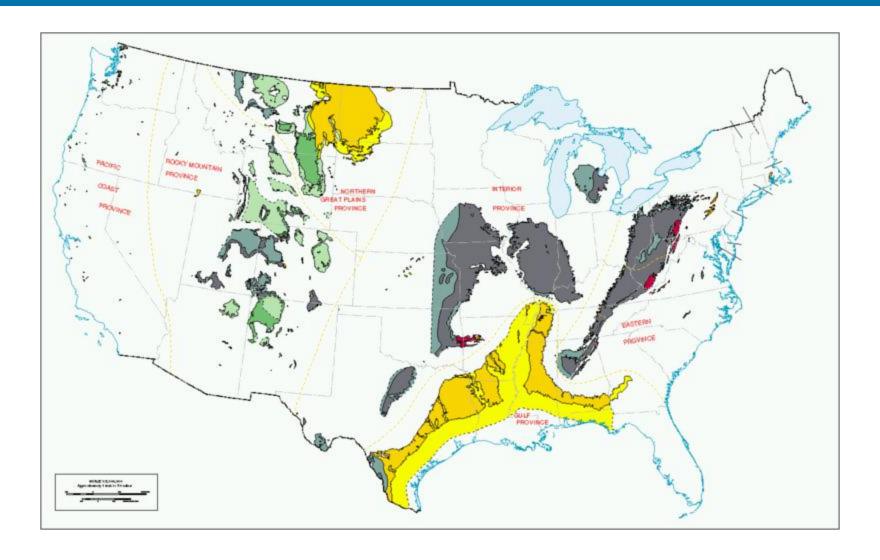
# Why & How Can U.S. Include Clean Coal in a "Clean Energy Standard"? List of Global Coal Reserves

Proved recoverable coal reserves at end-2006 (million tonnes (teragrams))

Country	Bituminous & S anthracite	ubBituminous & lignite	TOTAL	Share
<u>United States</u>	111,338	135,305	246,643	27.1
Russia	49,088	107,922	157,010	17.3
China China	62,200	52,300	114,500	12.6
Indi a	90,085	2,360	92,445	10.2
👫 Australia	38,600	39,900	78,500	8.6
South Africa	48,750	0	48,750	5.4
Ukraine	16,274	17,879	34,153	3.8
K az akhstan	28,151	3,128	31,279	3.4
Poland	14,000	0	14,000	1.5
Brazi1	0	10,113	10,113	1.1

source: \*Description of world energy June 2007" (XLS). British Petroleum. June 2007. <a href="http://www.bp.com/liveassets/bp">http://www.bp.com/liveassets/bp</a> internet/globalbp/globalbp uk english/reports and publications/statistical energy review 2007/STAGING/local assets/downloads/spreadsheets/statistical review full report workbook 2007.xls. Retrieved 2007-10-22.

# Why Clean Coal? Location of United States Coal Reserves



# Why Clean Coal? Coal Dependant States

States <u>highly</u> dependent on coal for electric power produced & consumed in 2005	Percent dependency	National rank of state for total coal consumption in 2007
West Virginia	98%	7
Wyoming	97%	15
Indiana	96%	2
North Dakota	95%	21
Utah	93%	23
Kentucky	87%	6
Ohio	86%	4
Missouri	86%	11
Kansas	74%	22
North Carolina	60%	10
Tennesee	60%	14
Alabama	59%	9
Pennsylvania	54%	3

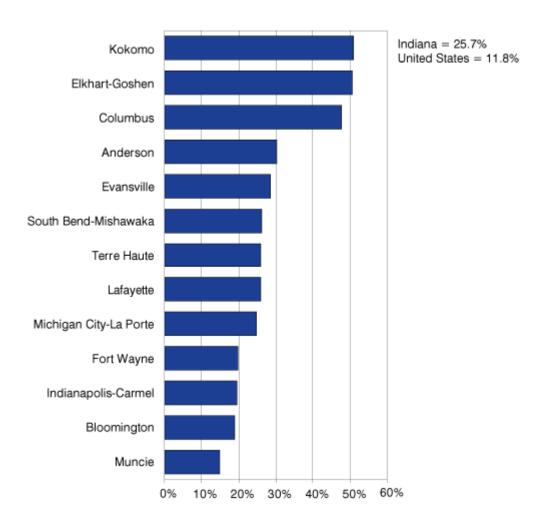
IN 2006, THERE WERE 82,595 PEOPLE EMPLOYED IN COAL MINING IN THE U.S. OF THOSE, 47,475 WORKED IN UNDERGROUND MINING, AND 35,398 WORKED IN SURFACE MINING.

## HERE IS A BREAKDOWN OF THE GEOGRAPHICAL DISTRIBUTION OF UNDERGROUND COAL MINING JOBS IN 2006 (WITH COAL PRODUCTION IN THOUSANDS OF SHORT TONS): [3][4]

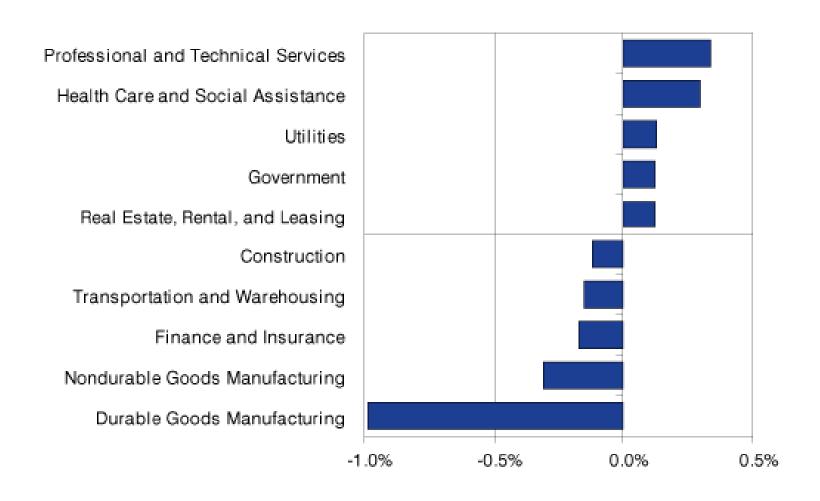
State	Total Coal Production	Underground Mining Jobs	Surface Mining Jobs	Total Jobs	Annual Production Per Miner
West Virginia	152,374	13,190	6,886	20,076	7.59
K entucky	120,848	11,902	6,057	17,959	6.73
Pennsylvania	66,029	5,099	2,427	7,526	8.77
Wyoming	446,742	128	5,709	5,837	76.54
Virginia	29,740	3,623	1,639	5,262	5.65
Alabama	18,830	2,621	1,574	4,195	4.49
<b>Illinoi</b> s	32,729	3,507	470	3,977	8.23
Indiana	35,119	1,231	1,627	2,858	12.29
Ohio	22,722	1,384	1,029	2,413	9.42
Colorado	36,322	1,682	547	2,229	16.30
Texas	45,548	0	2,138	2,138	21.30

### Indiana The Most Manufacturing Intensive State in the U.S.

### Manufacturing's Share of Total GDP in Indiana MSAs



# Industries with the Largest Positive and Negative Contributions to Indiana's Real GDP Change, 2008



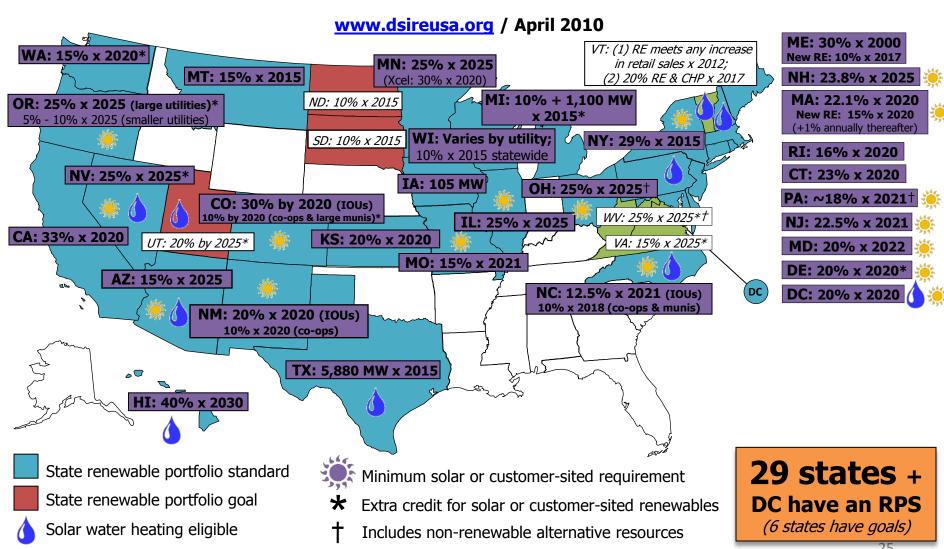
# Indiana's Compensation by Industry, 2007 – Manufacturing #1

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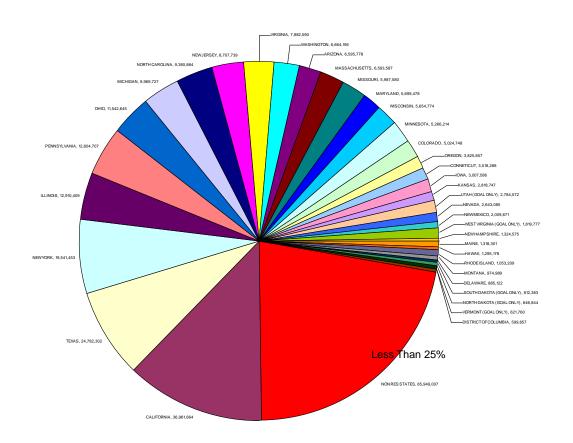
Rank	Industry	Compensation (in Thousands)	Share of Total Nonfarm Compensation	Percent Change, 2006-2007
1	Manu facturing	36,962,044	26.1%	0.1%
2	Government and Government Enterprises	21,780,476	15.4%	3.8%
3	Health Care and Social Assistance	14,909,046	10.5%	5.1%
4	Retail Trade	8,962,439	6.3%	1.2%
5	Construction	8,348,004	5.9%	6.6%
6	Wholesale Trade	7,778,635	5.5%	5.0%
7	Finance and Insurance	6,557,105	4.6%	0.9%
8	Professional and Technical Services	6,156,494	4.4%	8.2%
9	Transportation and Warehousing	5,701,462	4.0%	3.0%
10	Administrative and Waste Services	4,757,514	3.4%	5.5%

Source: Bureau of Economic Analysis

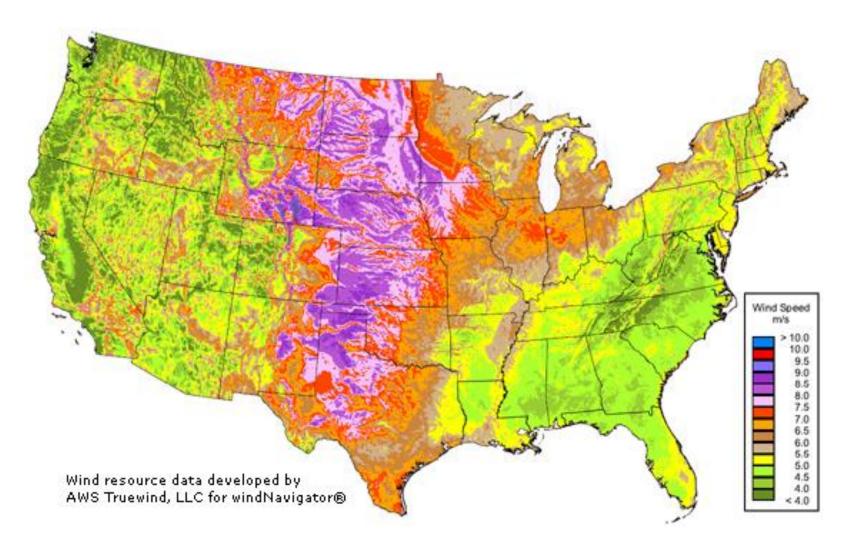
## Current Renewable Portfolio Standards State by State



# Current Renewable Energy Standards State by State Population – RES States: >75%



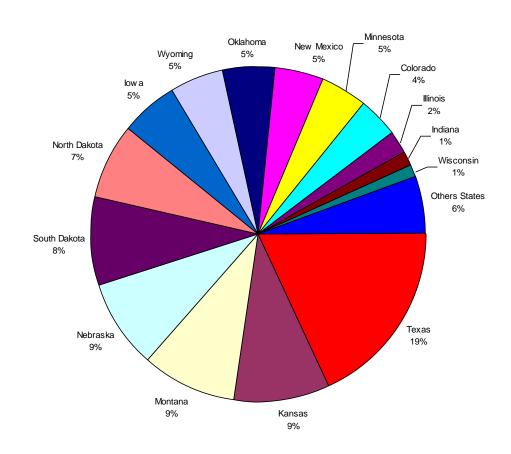
# National Renewable Energy Laboratory – AWSTRU Wind New U.S. Land Wind Potential 300% Higher Than Previously Estimated



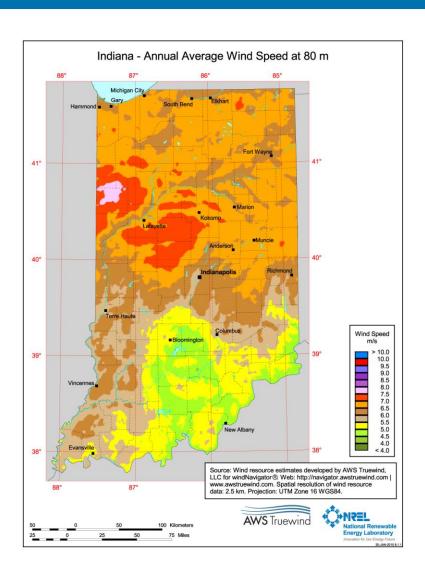
# Land Wind Energy Potential – Installed Capacity – Top 15 States

<u>State</u>	Megawatts of Rated Capacity	
1 Texas	1,901,529.70	18.18%
2 Kansas	952,370.90	9.11%
3 Montana	944,004.40	9.03%
4 Nebraska	917,998.70	8.78%
5 South Dakota	882,412.40	8.44%
6 North Dakota	770,724.30	7.37%
7 Iowa	570,714.20	5.46%
8 Wyoming	552,072.60	5.28%
9 Oklahoma	516,822.10	4.94%
10 New M exico	492,083.30	4.70%
11 Minnesota	489,270.60	4.68%
12 Colorado	387,219.50	3.70%
13 Illinois	249,882.10	2.39%
14 Indiana	148,227.50	1.42%
15 Wisconsin	103,757.10	0.99%
Others States		5.54%
Top 15 State Total:	9,879,089.40	94.46%
US 48 State Total:	10,458,945.00	100%

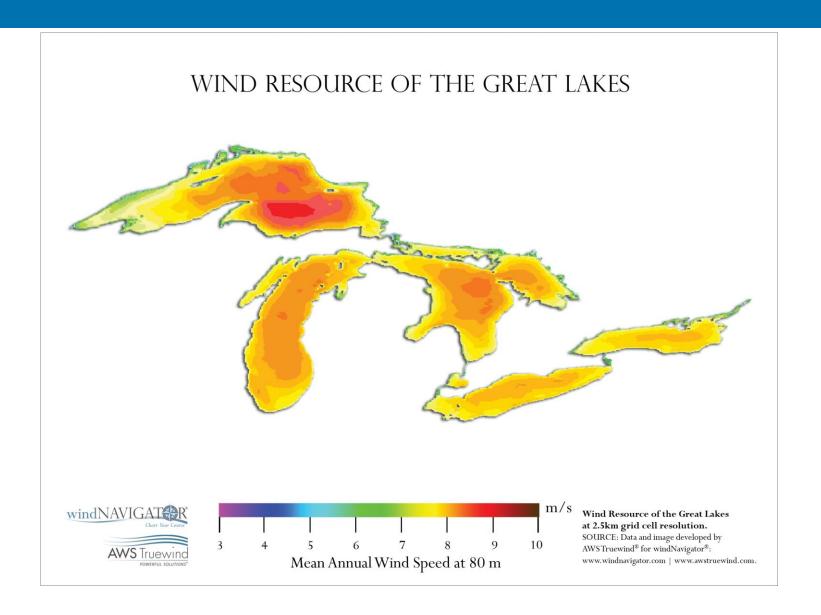
# Land Wind Energy Potential - Installed Capacity Top 15 States as of February 4, 2010



# Indiana "On Land" Wind Potential – Only 14th In The U.S. 36,420 Sq. M. With 148,228 MW Rated Capacity



### Off-Shore Development Potential Also Increases



### The Five Great Lakes – 295,000 Sq. m.





Executive Summary and Project Overview

Prepared for:

The National Renewable Energy Laboratory

Prepared by: EnerNex Corporation

January 2010

### **SCENARIO DESCRIPTION**

### The four scenarios are as follows:

- Scenario 1, 20% penetration—High Capacity Factor, Onshore
- Scenario 2, 20% penetration—Hybrid with Offshore
- Scenario 3, 20% penetration—Local with Aggressive Offshore
- Scenario 4, 30% penetration—Aggressive On- and Offshore

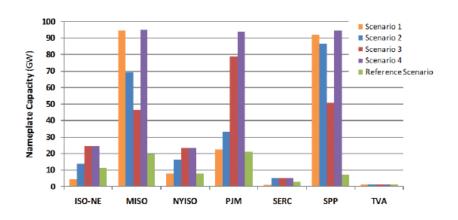
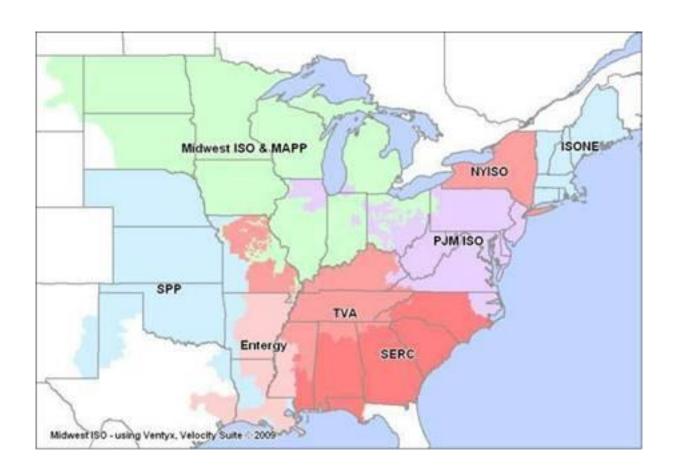


Figure 2. Summary of installed wind generation capacity by operating region for each scenario (Notes: ISO-NE = New England Independent System Operator, MISO = Midwest ISO, NYISO = New York ISO, PJM = PJM Interconnection, SERC = Southeastern Electric Reliability Council, SPP = Southwest Power Pool, TVA - Tennessee Valley Authority)

TABLE 1. TOTAL AND OFFSHORE WIND IN THE SCENARIOS								
Region	Scenario 1 20% High Capacity Factor, Onshore		Scenario 2 20% Hybrid with Offshore		Scenario 3 20% Local, Aggressive Offshore		Scenario 4 30% Aggressive On- and Offshore	
	TOTAL (MW)	Offshore (MW)	Total (MW)	Offshore (MW)	Total (MW)	Offshore (MW)	Total (MW)	Offshore (MW)
MISO/ MAPP <sup>a</sup>	94,808		69,444		46,255		95,046	
SPP	91,843		86,666		50,958		94,576	
TVA	1,247		1,247		1,247		1,247	
SERC	1,009		5,009	4,000	5,009	4,000	5,009	4,000
PJM	22,669		33,192	5,000	78,736	39,780	93,736	54,780
NYISO	7,742		16,507	2,620	23,167	9,280	23,167	9.280
ISO-NE	4,291		13,837	5,000	24,927	11,040	24,927	11,040
TOTAL	223,609	0	225,902	16,620	230,299	64,100	337,708	79,100

a MAPP stands for Mid-Continent Area Power Pool.



### Moving Wind Turbines by Ship



Indiana's Lake Michigan port handles wind turbines shipment from Europe

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